

**REMARKS:**

**I. Status of claims**

Claims 18-54 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 2,289,271 to *Kane et al.* (hereinafter "Kane"). Applicant respectfully traverses the rejection, and requests reconsideration of the rejection in light of the arguments and evidence presented below.

**II. The Kane reference viewed in light of allegedly obvious "design considerations" does not establish a prima facie basis for the rejection.**

**A. Summary of the Kane reference's teachings**

The Kane reference discloses an improved type of well casing<sup>1</sup> – not *drop pipe*<sup>2</sup> – for use in "oil fields."<sup>3</sup> Kane called for his well casing to be made out of "extremely strong steel"<sup>4</sup> and be designed to resist both "extremely high gas pressures"<sup>5</sup> and "several hours"<sup>6</sup> of "spudding the pipe,"<sup>7</sup> that is, ramming<sup>8</sup> or sharply dropping<sup>9</sup> "an entire string of several thousand feet in length" beyond obstacles in a deep well bore.<sup>10</sup> Kane specifically noted that "[i]t is an object of this invention to prevent leakage even under excessively high pressures"<sup>11</sup> and a further "object[] of the invention" to make the joints strong enough to "withstand the compressive forces of a spudding operation and also withstand the tensile stresses due to the weight of a long string of pipe."<sup>12</sup>

<sup>1</sup> See *Kane*, at col. 1, lines 19, 23, 45, 47; col. 2, lines 40-41; col. 3, lines 5, 8, 16; col. 4, lines 23-24, 30, 34, 38, 46.

<sup>2</sup> Note: claims 26-54 are specifically limited to drop pipe.

<sup>3</sup> *Kane*, at col. 1, line 43. Note: A "drop pipe" is a pipe that supports a pump and carries water from a pump in a water well, up to the surface. See '480 Patent, col. 3, lines 19-21.

<sup>4</sup> *Kane*, at col. 1, lines 47-48; see also col. 2, lines 40-42; col. 3, lines 34-45; col. 4, lines 38, 49-56, 59-71.

<sup>5</sup> *Id.* at col. 1, lines 43-44.

<sup>6</sup> *Id.* at col. 1, line 31.

<sup>7</sup> *Id.* at col. 1, line 29.

<sup>8</sup> *Id.* at col. 1, line 28.

<sup>9</sup> *Id.* at col. 1, line 36-37.

<sup>10</sup> *Id.* at col. 2, lines 4-25.

<sup>11</sup> *Id.* at col. 1, lines 50-54 (emphasis added).

<sup>12</sup> *Id.* at col. 2, lines 4-11 (emphasis added).

**B. The Examiner's rejection**

In the rejection, the Examiner acknowledged that "Kane et al. does not disclose that the pipe is made out of PVC." Office Action, at p.3. But the Examiner stated that "it would have been obvious to make the pipe out of PVC because the selection of a known material based upon its suitability *for its intended use* is a design consideration within the skill of the art." *Id.* (emphasis added). This conclusion can only be sustained if PVC would have been suitable for the circumstances in which Kane intended his pipe to be used.

**C. PVC is not suitable for Kane's intended purposes and requirements, which – combined with knowledge about the relative tensile and compressive strength characteristics of steel and PVC – teach away from the use of PVC.**

It is well established that no suggestion to modify a prior art device can be implied "when the modification render[s] the prior art reference inoperable for its intended purpose."<sup>13</sup> The case of *Application of Echerd*,<sup>14</sup> illustrates this principle well. There, the Examiner rejected a claim to an asbestos-based woven insulating pipe covering as obvious over the Stafford patent reference, which was directed to the manufacture of non-woven, asbestos-impregnated heat insulating blankets designed to "retain structural strength, flexibility, and handleability at temperatures up to 2000°F."<sup>15</sup> The Examiner reasoned, and the Board agreed, that it would be obvious to substitute the non-woven asbestos blanket of Stafford with woven asbestos fabric. But the Applicant produced evidence that the only type of asbestos suitable for woven fabrics would be progressively embrittled "upon exposure to temperatures above 900 to 1500°F."<sup>16</sup> On the basis of this evidence, the CCPA reversed the Examiner and Board's rejection: "There being no suggestion for, but rather strong reasons against, the substitution of a woven asbestos base . . . , the examiner's rejection cannot stand."<sup>17</sup>

As set forth further below, modifying Kane to substitute PVC for steel would render Kane inoperable for its intended purpose of making the joints strong enough to withstand both the compressive forces of a several-hour-long spudding operation and the tensile stresses of the weight of a several-thousand-foot-long string of pipe. Therefore, a skilled artisan seeking to achieve the purposes to which the Kane reference was directed would not have considered PVC to be an obvious substitute for Kane's steel.

<sup>13</sup> *In re Fritch*, 972 F.2d 1260, 1265 n.12 (Fed. Cir. 1992) (citing *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984)); accord, *Tec Air, Inc. v. Denso Mfg. Michigan Inc.*, 192 F.3d 1353, 1360 (Fed. Cir. 1999); *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1354 (Fed. Cir. 2001).

<sup>14</sup> 471 F.2d 632, 635 (Cust. & Pat. App. 1973).

<sup>15</sup> *Id.* at 634.

<sup>16</sup> *Id.* at 635.

<sup>17</sup> *Id.*

1. *PVC has only a small fraction of the tensile and compressive strength of high-strength steel.*

According to the Third Edition of the *Geothermal Direct-Use Engineering and Design Guidebook*, published in May, 1998, the tensile strength of blank steel casing is approximately 60,000 psi, and the compressive strength of blank steel casing is approximately 35,000 psi.<sup>18</sup> Wikipedia reports that the tensile strength of “high tensile” steel – a type of “extremely strong steel” as called for in Kane – is closer to 1860 MPa, which is about 270,000 psi.<sup>19</sup>

By contrast, the *Handbook of Thermoplastic Piping System Design* reports that PVC typically has a tensile strength of between 6000 and 8000 psi and a compressive strength of around 9600 psi.<sup>20</sup> Furthermore, the *Geothermal Direct-Use Engineering and Design Book* reference reports that PVC has among the weakest impact strengths, measured in foot-pounds/inch, of any common well casing material.<sup>21</sup> The *Handbook of Thermoplastic Piping System Design* confirms that “compared to steel, plastics have a relatively low ability to withstand sharp impact,” and “relatively low strength and stiffness.”<sup>22</sup>

Unquestionably, substituting PVC for steel would undermine the express objects of Kane’s invention – to design a pipe joint strong enough to withstand the compressive forces of a several-hour-long spudding operation and also withstand the tensile stresses due to the weight of a several-thousand-foot-long string of pipe.

2. *Kane’s high tensile and compressive strength requirements teach away from the use of PVC.*

Kane’s high tensile and compressive strength requirements also teach away from the use of PVC. “A prima facie case of obviousness can be rebutted if the applicant ...

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<sup>18</sup> Gene Culver, “Chapter 6: Drilling and Well Construction,” *Geothermal Direct-Use Engineering and Design Guidebook* at 146 (3d ed. 1998) (Exhibit A-1).

<sup>19</sup> See “Tensile Strength” at [http://en.wikipedia.org/wiki/Tensile\\_strength](http://en.wikipedia.org/wiki/Tensile_strength) (last visited on November 22, 2005).

<sup>20</sup> See THOMAS SIXSMITH & REINHARD HANSELKA, HANDBOOK OF THERMOPLASTIC PIPING SYSTEM DESIGN 16 (Marcel Decker, Inc. 1997) (Exhibit A-2) (reporting that PVC has a tensile strength of between 6000 and 7500 psi); *id.* at 66 (reporting a PVC tensile strength of 7950 psi and a compressive strength of 9600 psi).

<sup>21</sup> Culver, *supra* note 18, at 146 (Exhibit A-1) (indicating that PVC fiberglass well casing has an impact strength of 1 ft-lb/inch, compared to 20 ft-lb/inch for epoxy, but providing no values for steel because “the actual impact strength of steel is so high relative to the demands of water work that it can be ignored in design considerations”).

<sup>22</sup> See Sixsmith & Hanselka, *supra* note 20, at 7-8 (Exhibit A-2).

can show 'that the art in any material respect taught away' from the claimed invention."<sup>23</sup> "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, ... would be led in a direction divergent from the path that was taken by the applicant."<sup>24</sup> Clearly, a person of ordinary skill in the art who read the Kane reference would be led away from a PVC substitution by the high-strength objects of the Kane reference.

**D. A finding of an "obvious design choice" is precluded where the claimed structure and function it performs are different from the prior art.**

The Examiner proffered that substitution of PVC for steel was simply "a design consideration within the skill of the art." But significant differences in the structural and functional properties of PVC and steel can dictate differences in how the joints are constructed. The Federal Circuit has held that a "finding of 'obvious design choice' is precluded where the claimed structure and the function it performs are different from the prior art."<sup>25</sup> The different design considerations posed by PVC and steel preclude a finding that it is an "obvious design choice" to substitute one for the other, without making other changes to the design of the joint.

1. *Kane taught the use of a "plain unthreaded area" above the threaded portion for purposes, related to hot welding, that are not pertinent to PVC pipe.*

The structural design of Kane's pipe connection was driven, in significant part, by the need to hot weld the steel pipes together – a need that does not carry over to PVC. Kane disclosed only two purposes for the "plain unthreaded area" 5 of the bell above the threaded portion – both related to welding.<sup>26</sup> The first purpose of the "plain unthreaded

<sup>23</sup> *In re Haruna*, 249 F.3d 1327, 1335, 58 U.S.P.Q.2d 1517 (Fed. Cir. 2001) (quoting *In re Geisler*, 116 F.3d 1465, 1469, 43 U.S.P.Q.2d 1362, 1365 (Fed. Cir. 1997)).

<sup>24</sup> *In re Haruna*, 249 F.3d at 1335 (quoting *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360, 52 U.S.P.Q.2d 1294, 1298 (Fed. Cir. 1999)).

<sup>25</sup> See *In re Chu*, 66 F.3d 292, 299, 36 U.S.P.Q.2d 1089 (Fed. Cir. 1995) (citing *In re Gal*, 980 F.2d 717, 719, 25 USPQ2d 1076 (Fed. Cir. 1992)).

<sup>26</sup> It should be noted – with respect to claims 19, 27, 38, and 45 – that Kane never describes the relative lengths of the "plain unthreaded area" 5 and the threaded area 4. Although FIGS. 1 and 3 depict a "plain unthreaded area" 5 that is about as long or longer than the threaded area 4, Kane stresses that the area 5 in his figures are depicted in "somewhat exaggerated" form. Kane, at page 2, col. 3, lines 26-27 (emphasis added). Therefore, it is not proper to infer any teaching from Kane's drawings regarding the relative dimensions of areas 4 and 5. After all, "it is well established that patent drawings do not define the precise proportions of the elements," unless the specification so indicates. *Hockerson-Halberstadt, Inc. v. Avia Group Intern., Inc.*, 222 F.3d 951, 956 (Fed. Cir. 2000). As the CCPA explained in *In re Ringel*, 94 F.2d 225, 228 (C.C.P.A. 1938), "for the purposes of prosecution before the Patent Office, it is not necessary for the drawings to be drawn to scale, and unless they are specifically stated to be so, or unless by their nature

area” was to place some distance between the hot molten weld material – which was to be deposited on the shoulder 7 or 11 of the bell end – and the volatile lubricants placed on the threads.<sup>27</sup> The second purpose was to allow “the weld to be cut off,” without destroying the threads, “for salvage purposes.”<sup>28</sup> Neither of these two purposes would provide any motivation for placing a similar “plain unthreaded area” on a PVC pipe. PVC pipes are not customarily joined through heat welding,<sup>29</sup> and if they were joined in that destructive fashion, they could not be considered “reusable.” So even assuming one were to substitute Kane’s steel with PVC, Kane provided no motivation for retaining the “plain unthreaded area” portion of Kane’s structure.

2. *Steel and PVC have very different structural and functional properties.*

As already indicated above, PVC and steel also have very different structural and functional properties. Steel has significant strength advantages over PVC, making it far more suitable for deep well applications than PVC. Indeed, the Ohio Department of Natural Resources published a “Fact Sheet” on “Well Construction in a Buried Valley” which states that “[i]f an extremely deep well is going to be drilled, steel casing would be the best material to utilize. Steel is heavy, durable, and has a high tensile strength. It can hold up under extensive pressure.”<sup>30</sup> Steel can also withstand much higher temperatures than PVC, which is only suitable for relatively low-temperature applications. PVC has different kinds of advantages over steel – including resistance to both galvanic and chemical corrosion, longer life, lower weight, lower material costs, lower installed costs, greater flexibility, and smoother internal surfaces resulting in less biofilm build-up.<sup>31</sup>

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they could not be otherwise, they are not taken as so drawn, but are considered merely as representing the general relationship of the various elements therein shown.”

Indeed, Kane sheds even more doubt on the dimensional accuracy of its drawings by acknowledging that a *longer length* of thread engagement will be needed for the sharp crested threads of FIGS. 1 and 3 than for the square threads of FIG. 2 (see *Kane*, at page 2, lines 51-56) – notwithstanding those same Figures’ seemingly contradictory depiction of more thread engagement with the square threads than with the sharp crested threads.

Furthermore, persons of ordinary skill in the art know that the high-pressure applications with which the Kane reference was concerned would call for relatively long lengths of thread engagement. The *Machinery’s Handbook* states that “[i]t is recognized that in special applications, such as flanges for high-pressure work, longer thread engagement is used ....” ERIK OBERG ET AL., *MACHINERY’S HANDBOOK 1775* (25<sup>th</sup> ed. 1996) (Exhibit A-3). Thus, persons of ordinary skill in the art would be that much less likely to view Kane’s drawings as if they were made to scale.

<sup>27</sup> See *Kane*, at col. 3, lines 22-27.

<sup>28</sup> *Id.* at col. 3, lines 27-28.

<sup>29</sup> See *Sixsmith & Hanselka*, *supra* note 20, at 134 (Exhibit A-2) (Table lists joining methods for different types of plastic pipes, including PVC – “thermal fusion” is used for some types of plastics, but not PVC).

<sup>30</sup> Exhibit A-4.

<sup>31</sup> See *Sixsmith & Hanselka*, *supra* note 20, at 4-6 (Exhibit A-2).

Because the properties of steel are so different from those of PVC, the substitution of one for the other, without other changes, cannot be regarded as being merely a matter of "design choice."

**E. There is no suggestion or motivation to replace Kane's "extremely strong steel" with PVC.**

Other than what was asserted to be "obvious ... design consideration[s]," the Examiner cited no motivation for modifying the Kane reference. The Federal Circuit has held that although a prior art reference "may be capable of being modified to run the way [an] apparatus is claimed, there must be a suggestion or motivation *in the reference* to do so." Even the MPEP acknowledges that to establish a prima facie case of obviousness, there must be some suggestion or motivation to modify the reference or to combine the reference teachings, and that this suggestion or motivation "must . . . be found *in the prior art, not in applicant's disclosure*."<sup>32</sup> Kane clearly does not provide the necessary motivation for substituting PVC for steel.

In *In re Dembiczak*,<sup>33</sup> the Federal Circuit reversed the Board's obviousness analysis, which had concluded that "the substitution of orange plastic for the crepe paper of Holiday and the paper bags of Shapiro *would be an obvious design choice*."<sup>34</sup> The Federal Circuit rejected this reasoning, holding that the Board had failed to demonstrate how the references "teach or suggest their combination ... to yield the claimed invention."<sup>35</sup> The Federal Circuit reiterated that the law requires a "*rigorous application* of the requirement for a showing of the teaching or motivation to combine prior art references" as an antidote to "the subtle but powerful attraction of a hindsight-based obviousness analysis."<sup>36</sup> "That is, *the showing must be clear and particular*. Broad conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence.'"<sup>37</sup>

**F. There was no motivation for persons in the water well PVC pipe industry to look to Kane's teachings.**

The prior art also provided no motivation for a skilled artisan to look toward Kane for guidance or teachings on PVC pipe connections. Even if there were such a motivation, it would be improper to assume that such an artisan would adopt Kane's

<sup>32</sup> See MPEP § 2143 (emphasis added) (citing *In re Vaack*, 947 F.2d 488 (Fed. Cir. 1991)).

<sup>33</sup> 175 F.3d 994 (Fed. Cir. 1999).

<sup>34</sup> *Id.* at 1000 (emphasis added).

<sup>35</sup> *Id.*

<sup>36</sup> *Id.* at 999 (emphasis added).

<sup>37</sup> *Id.* (emphasis added).

teachings regarding the structural design of the steel pipe connection while discarding Kane's teachings about the use of steel.

1. *A skilled artisan in PVC pipe connection design would not turn to steel pipe connection art for guidance.*

In "determining whether an inventor would reasonably be motivated to go to the field in which the examiner found the reference, in order to solve the problem confronting the inventor, . . . it is necessary to consider 'the reality of the circumstances' – in other words, *common sense* – in deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor."<sup>38</sup> Kane's teachings about an improved, weldable pipe connection for high-performance steel oil well casing should not be taken out of context, but instead "must be considered in the context of the teaching of the entire reference."<sup>39</sup>

Common sense suggests that a skilled artisan would not have looked toward Kane for guidance on PVC pipe connections because Kane was focused on designing a connection that was both threadable and weldable, which "prevent[ed] such heating of the spigot as will cause gas to form along the threads where lubricant is placed,"<sup>40</sup> and which would also withstand extremely high tensile and compressive stress environments. A skilled artisan would not have been faced with a need to provide a weldable connection for a PVC pipe that would "prevent such heating of the spigot as will cause gas to form along the threads where lubricant is placed." Likewise, a skilled artisan would not have reasonably expected a PVC pipe to withstand the extremely high tensile and compressive stress environments contemplated in Kane. Therefore, a skilled artisan would not have looked to Kane for guidance on PVC pipe connections.

2. *If tensile and compressive strength issues prompted a skilled artisan to turn to Kane for guidance on making a stronger pipe and pipe connection, that skilled artisan would be motivated to also adopt Kane's suggestion that high strength steel be used.*

If a skilled artisan were to have looked to the Kane for guidance on making a better pipe connection, it is unlikely he would have adopted Kane's teachings regarding the structure of the connection while rejecting Kane's teachings of the use of steel. In other words, if a skilled artisan were so concerned about tensile and compressive stress issues that he would look to Kane for a solution, such an artisan would probably also adopt Kane's teaching that he also use "extremely strong,"<sup>41</sup> "good quality"<sup>42</sup> steel in place of the much weaker PVC.

<sup>38</sup> *In re Oetiker*, 977 F.2d 1443, 1447, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992) (emphasis added).

<sup>39</sup> *In re Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d 1313 (Fed. Cir. 2000).

<sup>40</sup> See *Kane*, at col. 2, lines 24-26.

<sup>41</sup> *Id.* at col. 1, line 48.

It is well established that “[i]t is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.”<sup>43</sup> Rather, one “must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination *in the manner claimed*.”<sup>44</sup> Applicants respectfully submit that the prior art provided no such motivation.

**G. The prior art taught skilled artisans seeking to improve the pressure rating or strength of their PVC pipes to steer away from threaded configurations altogether.**

There have long been two primary methods of joining PVC pipes – solvent cementing and mechanical joining.<sup>45</sup> The most common methods of mechanical joining fall into four subcategories: (1) threading, (2) flanging, (3) elastomeric seals, and (4) compression couplings and inserts.<sup>46</sup> Before Morris Haney and Roy Thein commercialized their invention, threaded joint assembly of PVC pipes typically required a time consuming process using separate couplings to join the lengths.<sup>47</sup>

Prior to Modern Products’ invention, skilled artisans had a generally negative view of threaded joint assembly for PVC pipes. Page 135 of the 1997 *Handbook of Thermoplastic Piping System Design* reports that **adding threads to PVC pipe usually reduces its pressure rating by half**.<sup>48</sup> On page 194, it advises that “[i]f at all possible do not use threaded connections for equipment subject to vibration. Threads can be a source of notch propagation and result in premature failure.”<sup>49</sup> So significant are these problems that on page 138, it peremptorily advises, “Do *not* thread Schedule 40 pipe.”<sup>50</sup> Furthermore, the 1997 *Handbook* estimates that joining Schedule 80 PVC pipes takes considerably *longer* using threaded joints than using solvent-cemented welds or flanged

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<sup>42</sup> *Id.* at col. 2, line 41.

<sup>43</sup> *In re Hedges*, 783 F.2d 1038, 1041, 228 U.S.P.Q. 685 (Fed. Cir. 1986).

<sup>44</sup> *In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453 (Fed. Cir. 1998) (emphasis added).

<sup>45</sup> *See Sixsmith & Hanselka*, *supra* note 20, at 132-133 (Exhibit A-2).

<sup>46</sup> *Id.* at 135-36.

<sup>47</sup> *See* Section 1.132 Affidavit of Morris Haney (hereinafter “Haney Affidavit”) (Exhibit B), at ¶ 8.

<sup>48</sup> *See Sixsmith & Hanselka*, *supra* note 20, at 135 (Exhibit A-2); *see also id.* at 63 (comparing pressure ratings of threaded and unthreaded Schedule 80 PVC pipe).

<sup>49</sup> *Id.* at 194.

<sup>50</sup> *Id.* at 138 (emphasis added); *see also id.* at 418-19 (showing that Schedule 40 and 80 nominal 1 inch diameter PVC pipe have respective nominal wall thicknesses of 0.133 and 0.179 inches).



joints.<sup>51</sup> All of these factors combined to discourage the use and development of improved types of threaded PVC pipe – thereby teaching away from the claimed invention.

The patented design overcomes the disadvantages of prior art PVC threaded joints cited in the Handbook; that is, the diminished strength associated with prior art threaded connections and the wasted time, as compared to other joining methods, required to connect the pipes. Modern Product's invention also enabled such pipes to be unscrewed and reconnected multiple times, making them "reusable."

**II. If a prima facie basis for the rejection exists, there is compelling secondary evidence of the non-obviousness of the claimed invention.**

In the famous 1966 case of *Graham v. John Deere*,<sup>52</sup> the Supreme Court held that evidence of "commercial success, long felt but unsolved needs, failure of others, etc." are relevant "indicia of obviousness or nonobviousness." Applicants have truly remarkable secondary evidence of the non-obviousness of their invention. The evidence shows that when Applicants' small pipe manufacturing company, Modern Products Industries, Inc. (hereinafter "Modern Products"), introduced the patented product in September, 2001, it met with immediate and stunning commercial success. The evidence also shows that other pipe manufacturers, including the second largest company in the industry, quickly took notice and began making their own copycat versions. The evidence further shows that Modern Products' invention met a long-felt, but unsolved need, within the PVC pipe industry.

**A. Modern Products – a bit player in a huge, multi-billion dollar industry – began selling the patented product in late 2001.**

Inventors Roy Thein and Morris Haney are the President and General Manager, respectively, of Modern Products Industries, Inc., a small pipe manufacturer in Beeville, Texas, that was formed in 1972 to manufacture water well industry products. Inventors Thein and Haney conceived and reduced the invention set forth in the '480 patent to practice in the spring and summer of 2001.<sup>53</sup> Their newly designed PVC drop pipe had conventional male threads on one end and female threads on the other end (machined into a belled section) that did not require any couplings. The interiorly-threaded belled female end also had a lead-in section designed to add lateral strength to the pipe and funnel and align the male threads of a similar pipe into the female threads. In September, 2001, Modern Products marketed this new design under the trade name Shur-Align.<sup>54</sup> A collage of pictures of the Shur-Align drop pipe is reproduced below:

<sup>51</sup> *Id.* at 248-49.

<sup>52</sup> 383 U.S. 1, 17-18 (1966).

<sup>53</sup> Haney Affidavit (Exhibit B), at ¶ 11.

<sup>54</sup> *Id.* at ¶ 13.



The industry embraced the Shur-Align product, and Modern Products' sales took off. In 2002, Modern Products sold 2.8 million pounds (or \$1.8 million) of Shur-Align product – which accounted for 16.4% of Modern Products' sales revenues that year. In 2003, Modern Products sold 3.3 million pounds (or \$2.3 million) of the Shur-Align product – accounting for 23% of Modern Products' sales revenues that year.<sup>55</sup> Modern Products' sales only leveled off when competitors took notice and started selling copies of the Shur-Align product, notwithstanding the pendency and eventual issuance of this divisional's parent application as U.S. Patent No. 6,666,480 ("the '480 patent").

To appreciate the significance of the secondary evidence described below, it is important to keep in perspective the relative size of Modern Products and its competitors.

Modern Products has never been a big company. The *Plastics News*' December 29, 2003 "Market Data Book," published just six days after the parent to this application issued as the '480 patent, placed Modern Products in a seven-way tie for 86<sup>th</sup> place among the ranks of 102 producers of pipe, profile, and tubing extrusion products.<sup>56</sup>

The image is a screenshot of a market data book table titled "C PIPE, PROFILE & TUBING EXTRUSION". It lists various companies and their financial data. The table is organized into several columns, including Company, Sales, Profit, Assets, and various financial ratios. The data is presented in a grid format with alternating shaded rows.

Company	Sales	Profit	Assets	Equity	Debt	Capital	Operating	Financial	Market
1. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
2. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
3. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
4. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
5. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
6. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
7. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
8. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
9. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
10. HANLEY PIPE & TUBING CO.	10.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

<sup>55</sup> Haney Affidavit (Exhibit B), at ¶ 14.

<sup>56</sup> Exhibit A-5, at pp. 35-40.

*Plastics News* actually overestimated Modern Products' sales for the previous year by almost a factor of two<sup>57</sup> – thus, Modern Products should have been at the very end of *Plastic News*' list.

**B. CertainTeed, the #2 giant in the industry, quickly noticed #86 Modern Products' success and copied the product.**

Modern Products' commercial success was quickly noticed by CertainTeed – which *Plastic News* ranks as the #2 company in the industry, with an estimated \$700 million in pipe, profile, and tubing sales.<sup>58</sup> Within two months of Modern Products' first sale, CertainTeed immediately began making significant efforts to copy the patented features of Modern Products' product.

Attached as exhibits to these remarks are several redacted internal CertainTeed e-mails<sup>59</sup> and memoranda produced to Modern Products in the case of *CertainTeed Corp. v. Modern Products Industries, Inc., et al.*, Cause No. 03-cv-2131 (PBT) (E.D. Pa.). The candid statements made in these e-mails and memoranda were made from the perspective of a fierce competitor that sued Modern Products in hopes of invalidating the '480 patent. Thus, the evidence presented below provides very striking and compelling evidence of the '480 patent's nonobviousness.

*1. Industry giant CertainTeed's internal communications testify to the commercial success of tiny Modern Products' Shur-Align product.*

On November 13, 2001 – only 6 weeks after Modern Products' first sale of a Shur-Align product – a CertainTeed sales representative began writing e-mails about its commercial success. The representative wrote that “**this new product from Modern is making substantial gains.**”<sup>60</sup> In a second e-mail, dated December 4, 2001, the representative reiterated the impact Modern Products' new product was having:

Modern Plastics continues to expand their distribution on their th[reade]d drop pipe product. **Distributors are buying this product that have never purchased well products from Modern before. . . .** [D]rillers and distributors alike are endorsing this new product. **This is a key topic of discussion with almost every distributor I talk with. . .** The advent of

<sup>57</sup> Haney Affidavit (Exhibit B), at ¶ 6.

<sup>58</sup> See Exhibit A-5, at p. 35.

<sup>59</sup> This internal correspondence was designated as confidential, but pursuant to a settlement of the Pennsylvania lawsuit, CertainTeed agreed to permit Modern Products to disclose this information to the PTO in a form redacted to protect the identity of the authors and recipients of the e-mails and memoranda.

<sup>60</sup> See Exhibit A-6 (emphasis added).

this new product ... [has] put us in a very poor position in this market.  
We cannot afford to sit on the fence much longer.<sup>61</sup>

As shown above, #2 CertainTeed noted that "every distributor" in the multi-billion dollar pipe industry was aware of and keenly interested in tiny #86 Modern Product's new product – *and only 2 months after the Shur-Align product was launched!* Furthermore, #2 CertainTeed felt that #86 Modern Product's Shur-Align product was already putting CertainTeed in "a very poor position in this market" – *again, only 2 months after the Shur-Align product was launched!*

A few months later, the Director of Marketing for CertainTeed's Pipe's and Plastics Group wrote an urgent memorandum testifying to the past, slow pace of innovation in the field of PVC drop pipe, and the surprising impact of Modern Product's innovation on that field:

CertainTeed and several other manufacturers have been producing small diameter (1", 1 1/4", 2") drop pipe for submersible pumps with male threads on both ends **for quite some time**. This type of pipe requires separate couplings (either plastic or metallic) to join the 20' lengths. **A small competitor in Texas, Modern Products, recently introduced a product line** with conventional male threads on one end and female threads on the other side (machined into a belled section) that does not require any couplings. Product is marketed under the trade name Shur-Align. **This product assembles more quickly and even with a premium on the pipe, saves the contractor money, as he no longer has to purchase separate couplings.**<sup>62</sup>

Rarely will one ever find more persuasive secondary evidence than this. These candid, unrehearsed, and un-spun praises and admissions regarding Modern Products' commercial success and the market's long-felt-needs came from the "mouth" of a fierce adversary and competitor.

2. *CertainTeed launched a significant effort to copy the soon-to-be patented features of the Shur-Align product.*

CertainTeed quickly resolved to make its own copycat version of Modern Products' SHUR-ALIGN™ product. In early December, 2001, CertainTeed assigned its research and development department the responsibility of evaluating the Modern Products' SHUR-ALIGN™ product.<sup>63</sup> CertainTeed's internal e-mails once again show that CertainTeed expressed an "intent ... to come out with a product that is **functionally**

<sup>61</sup> See Exhibit A-7 (emphasis added).

<sup>62</sup> See Exhibit A-9 (emphasis added).

<sup>63</sup> See Exhibit A-7.

**equivalent** to what Modern (Products) is producing.”<sup>64</sup> CertainTeed especially wanted to copy, and initially thought it could improve upon, Modern Products’ “thread ‘lead-in’” section – an important feature of both the ‘480 patent and the pending claims of this divisional.<sup>65</sup>

3. *CertainTeed expended great effort to develop a product that was functionally equivalent to the patented Shur-Align product.*

CertainTeed’s internal e-mails show that CertainTeed’s engineers had a difficult time copying the Shur-Align product, and had to expend great effort to develop a solution. CertainTeed had problems getting their samples to “thread up as well” as Modern Products.<sup>66</sup> Also, “the male end did not thread far enough into the tapered female threads.”<sup>67</sup> This was a serious problem because “insufficient thread engagement can obviously weaken the joint.”<sup>68</sup> By contrast, contractors “like the way Modern’s pipe threads together, where it will spin to hand stop and then the contractor will just have to snug it up around one turn or so.”<sup>69</sup> CertainTeed also learned that contractors preferred Modern Products’ “thickened end product,”<sup>70</sup> which, together with the length of the lead-in section, improved the lateral strength of the product. But CertainTeed’s engineers found the task of thickening their own end product to be almost impossible: “[T]here is absolutely no possible way to thicken 1”-80 from .179 to .297 or 1.25” from .191 to .297. It’s out of the question.”<sup>71</sup>

After manufacturing some samples, CertainTeed ran several side-by-side tensile strength and pressure tests of the Kwik-Set product and the SHUR-ALIGN™ product.<sup>72</sup> Even after months of copying efforts, CertainTeed’s “initial 1000 hours test failed (leaked).”<sup>73</sup>

Over and over again, CertainTeed’s engineers went back to the drawing board, scouring Modern Products’ SHUR-ALIGN™ product and literature for details that would help them design their copycat product. On April 30, CertainTeed’s Director of Marketing for its Pipes and Plastics Group reported that the company had “arranged to

<sup>64</sup> See Exhibit A-8 (emphasis added).

<sup>65</sup> *Id.*

<sup>66</sup> See Exhibit A-12.

<sup>67</sup> See Exhibit A-11.

<sup>68</sup> *Id.*

<sup>69</sup> See Exhibit A-12.

<sup>70</sup> See Exhibit A-11.

<sup>71</sup> See Exhibit A-13.

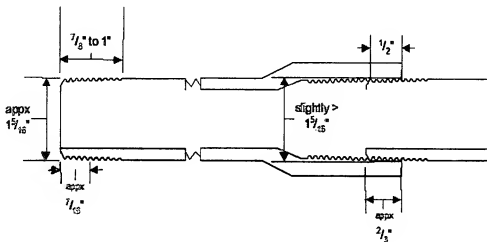
<sup>72</sup> See Exhibit A-14.

<sup>73</sup> See Exhibit A-13.

have samples of Modern's product sent to Blue Bell for comparative testing."<sup>74</sup> On May 9, the R&D head of CertainTeed's Integral Bell Threaded Drop Pipe project asked the Director of Marketing: "Can you forward the competitor's product brochure or any other information with respect to the product meeting any code?"<sup>75</sup> And even as late as October 18, 2002, the Director of Marketing pleaded, "can you measure a Modern sample to see what they are doing?"<sup>76</sup> After several months of effort, CertainTeed finally succeeded in making copycat product, which it marketed under the name Kwik-Set.

4. *CertainTeed's Kwik-Set product is covered by the pending claims.*

CertainTeed's Kwik-Set product not only copied most of the features of the Shur-Align, it was also covered by claims 1, 2, 3 and 5 (at least) of the '480 patent. This is apparent by looking at a picture of the Kwik-Set pipe (as shown on the Kwik-Set brochure at **Exhibit A-16** and reproduced on page 17 below) and by taking measurements of CertainTeed's 1" nominal-diameter version of the Kwik-Set PVC drop pipe product, diagrammed below<sup>77</sup>:



<sup>74</sup> See Exhibit A-9.

<sup>75</sup> See Exhibit A-10.

<sup>76</sup> See Exhibit A-13.

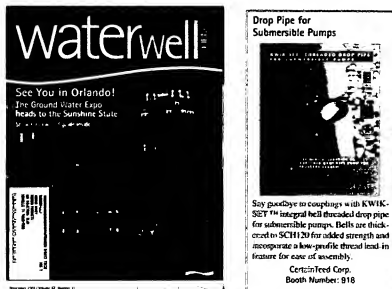
<sup>77</sup> CertainTeed's pipe had standard NPT, ASTM F-1498 conforming, tapered male and female threads. The diagram shows that CertainTeed's Kwik-Set pipe had a 1/2" lead-in section that, due to the geometry of the threads, was long enough to receive about 7/32" of nominal male threads before they began to interlock with the female threads. Furthermore, there were about 7/16" to 1" of nominal male threads – but only about 7/16" of these would interlock when tightened to the recommended tightness of 1/2 turn past hand-tight (hand-tight is the point where the crests of the male threads are in complete contact with the troughs of the female threads, but before any deformation occurs). The 7/32" limitation easily meets the "at least long enough to receive most" of the 7/16" of mating threads. Furthermore, the second enlarged interior diameter was just slightly greater than the approximately 1 3/16" exterior diameter along the length of the pipe. CertainTeed's 2003 specifications for its Kwik-Set pipe – which Modern Products is not at liberty to disclose – are consistent with these measurements.

As is evident from the drawing above and testimony discussed below, the Kwik-Set pipe would meet all of limitations of the pending independent claims, and many of the dependent claims as well.

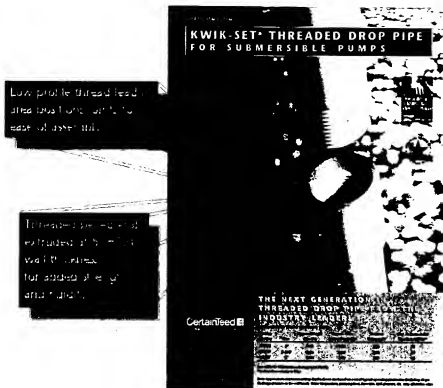
5. *CertainTeed's advertisements establish a clear nexus between the claims and their copying efforts.*

It should be noted that each of the pending independent claims recite that the "second enlarged interior diameter" provides increased "lateral strength" and/or eases assembly by "funneling said PVC pipe and said similar adjacent PVC pipe together." CertainTeed's marketing efforts focused on these very features – thereby establishing a clear nexus between CertainTeed's copying efforts and the claims.

CertainTeed placed an ad – reproduced below and attached as **Exhibit A-15** – in the November 2003 issue of the Water Well Journal that emphasized the "added strength" and "ease of assembly" provided by the "lead-in" feature:



CertainTeed's 2004 Kwik-Set brochure (**Exhibit A-16**) also emphasizes the "ease of assembly" and "added strength" provided by the lead-in section:



CertainTeed also admitted, through deposition testimony, that the belled end of the Kwik-Set I and II pipes will resist forces exerted on the pipe in a direction perpendicular to the length of the pipe.<sup>78</sup> Specifically, Mr. Stott admitted that “if you were to bend the pipe whatever strength is there would come from the threads and the bell itself.”<sup>79</sup> Mr. Stott also admitted that the belled end of the Kwik-Set I and II pipes help to funnel two PVC pipes together:

Q. And if you look down towards the middle of that advertisement, it -- it describes the thread lead-in area positions joins for ease of assembly?

A. Yes. It does say that.

Q. So, again, I'm going to ask you the question. Well do you agree that the purpose of the lead-in area was the -- was to position the pipes for assembly?

<sup>78</sup> May 12, 2004 Deposition Transcript of CertainTeed 30(b)(6) witness John Stott (hereinafter referred to as “Stott Depo.”), at 225:11-226:21 (Exhibit A-17)

<sup>79</sup> *Id.*



A. I think it helps to position the pipe, but it's not, you know, the product will work fine without it, but it -- it would like the gun barrel bullets started in the right place, you know.

Q. Well, in other words, it kind of funnels the male end down to the female thread, right?

A. It does.<sup>80</sup>

The foregoing evidence firmly establishes a clear nexus between CertainTeed's copying efforts and the claims of the '480 patent and this divisional.

**C. Other competitors also noticed Modern Products' success and copied, or announced an intention to copy, the Shur-Align product.**

***1. Northern Pipe Products also came out with a copycat product in response to Modern Products' Shur-Align product.***

Not long after CertainTeed showed the industry a pre-release sample of its Kwik-Set product at the July 2002 South Atlantic Well Drillers trade show, Northern Pipe Products, Inc. ("Northern Pipe"), a medium-size pipe manufacturer based in North Dakota, launched its own efforts to make a copy of Modern Products' Shur-Align product.

On March 10, 2004, Modern Products filed suit against Northern Pipe in the United States District Court for the District of North Dakota. The discovery Northern Pipe produced, as well as the deposition of Victor Weigel, who for 20 years had been the manager of Northern Pipe's engineering department, provides yet further secondary evidence of the nonobviousness of the '480 patented invention.

In the fall of 2002, Northern Pipe contacted Plastics Extrusion Machinery (PEM).<sup>81</sup> PEM is a manufacturer of extrusion machinery used to make PVC pipe<sup>82</sup> – and PEM manufactured the machinery to make CertainTeed's infringing pipe.<sup>83</sup> PEM offered to build Northern Pipe a machine identical to the one that it built for CertainTeed for making PVC drop pipe with male threads at one end and female threads at the other.<sup>84</sup> Northern Pipe accepted PEM's offer.<sup>85</sup> Once equipped with PEM's machinery, Northern

<sup>80</sup> *Id.* at 89:10-90:6

<sup>81</sup> See relevant portions of the Nov. 18, 2004 Deposition of Victor Weigel (hereinafter "Weigel Depo."), (Exhibit A-18), at 51:20-54:5.

<sup>82</sup> *Id.* at 18:1-14.

<sup>83</sup> See Stott Depo. (Exhibit A-17), at 196:6-11.

<sup>84</sup> See Weigel Depo. (Exhibit A-18), at 52:4-56:3.

<sup>85</sup> *Id.* at 59:9-16.

Pipe began manufacturing and selling an infringing male/female drop pipe under the TSW trademark.<sup>86</sup>

Northern Pipe's TSW drop pipe was very similar to CertainTeed's Kwik-Set pipe, a drawing of which is depicted on page 15 above. The only material difference was that Northern Pipe's lead-in section was about  $\frac{3}{8}$ " in length.<sup>87</sup> Mr. Weigel agreed that even at the maximum recommended tightness, less than 0.6" of the male threads on the male end were used and that the "remaining threads ... on the male end really serve no purpose."<sup>88</sup> Therefore, Northern Pipe's TSW pipe would meet all of limitations of the pending independent claims, and many of the dependent claims as well.

2. *Other competitors also announced plans to develop their own copycat products before learning of Modern Products' pending patent rights.*

In 2003, Modern Products learned from a trade show that two other pipe manufacturers – PW Eagle, Inc. and Pipelife Jet Stream Inc. – ranked #7 and #46, respectively, by the *Plastics News* Market Data Book – had announced intentions to develop imitations of the Shur-Align product.<sup>89</sup> Modern Products' counsel sent both companies letters<sup>90</sup> warning them of Modern Products' pending patent application and intention to enforce any patent rights it received. To the best of Modern Products' knowledge, these two competitors heeded Modern Products' warning.

In 2003, Modern Products also took out advertisements in the *Water Well Journal* and *National Driller* trade journals giving the entire industry notice of Modern Products' pending patent rights and its intent to enforce those rights.<sup>91</sup> Furthermore, when Modern Products filed suit against CertainTeed and Northern Pipe Products after the '480 patent issued, word regarding the lawsuits quickly traveled through the industry. Applicants believe that these notification efforts discouraged many other competitors from also launching their own copycat versions of the Shur-Align product.

#### **D. Modern Products' invention satisfied a long-felt need.**

The reason that the Shur-Align product was so commercially successful, and was quickly copied by others, is because it satisfied a long-felt need. In his attached affidavit, inventor Morris Haney – who has over 40 years of experience in the industry – writes

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<sup>86</sup> *Id.* at 61:21-62:5, 64:20-65:2.

<sup>87</sup> *Id.* at 115:2-14.

<sup>88</sup> *Id.* at 109:25-111:1.

<sup>89</sup> See Haney Affidavit (Exhibit B), at ¶ 15.

<sup>90</sup> See Exhibits A-19 & A-20.

<sup>91</sup> See Exhibit A-21.

about the recognized, persistent, and long-felt problems that prompted he and Roy Thein to come up with their invention:

For years, various pipe materials and various methods of connecting pipes have been used in the water well industry. It was common to find metal pipe such as galvanized steel used in combination with metal fittings or couplings to joint the pipe together. These galvanized metal pipes tended to corrode, causing leakage and breakage at the pipe joints. Stainless steel pipe has also been used. However, stainless steel pipe is typically too expensive for water well applications.

Plastic or PVC pipe has also been used in the water well industry for many years. In the past, separate PVC pipes have typically been connected with threaded plastic or metal couplings or with the use of cement or pipe dope. Connecting pipe with separate couplings or fittings or with the use of cement is particularly cumbersome and time consuming and, once again, the pipes tend to leak at the connections. In addition, the PVC pipe is typically rendered non-reusable.

Furthermore, many types of fittings have a tendency to crack or break, causing additional leakage. Others in the past have attempted to solve the problem by, for example, adding additional joints or fittings, but none of these alternative solutions were satisfactory, and they were more expensive and cumbersome than the present invention.

In general, the connections of water well pipes in water well applications are subjected not only to tensile and compressive forces, but also to lateral forces on the wall of the pipe in a direction perpendicular to the length of the pipe. These lateral forces can be caused by internal pressure or by bending the pipe during insertion and removal from the well. It is common in the industry for bending of the pipe to cause failure at the threads due to the combination of tensile, compressive, and lateral forces on the threads and at the walls of the threaded portion of the pipe, which are weaker due to the existence of the threads.

Roy Thein, the President and part owner of Modern Products Industries, Inc., and I recognized these problems with pipes and the pipe connections in the water well industry. In the spring and summer of 2001, Roy Thein and I came up with a new design for threaded PVC pipe which allowed for an exteriorly threaded male end of one pipe to be connected to an interiorly threaded, belled female end of a second pipe without the need for fittings or cement and which provide for lateral strength. The nonthreaded, outermost section of the female end acts to provide lateral strength to the connection of the pipes by receiving and withstanding the lateral forces created by bending of the pipe and thereby relieves the stress

on the threads and the forces exerted on the weaker walls of the pipe opposite the interior threads.<sup>92</sup>

The invention satisfied the long-felt need for a solution in ways where other tried and tested alternatives (such as the use of stainless steel and brass couplings) failed. In response to questions posed by CertainTeed's counsel at their depositions, inventors Morris Haney and Roy Thein noted several ways in which their invention both solved the long felt needs of the industry *and* avoided problems associated with attempted but inadequate prior art solutions:

- Eliminated the need for a coupling, and the labor expense associated with installing the coupling.<sup>93</sup>
- Eliminated the need to replace fittings on regular basis – frequently, galvanized fittings have to be replaced on an annual or semi-annual basis.<sup>94</sup>
- Avoided disadvantages associated with use of metallic couplings, which are corrosive.<sup>95</sup>
- Avoided expense and added weight of using more expensive and heavier stainless steel or brass couplings.<sup>96</sup>
- Avoided the cold-line weakness associated with plastic couplings.<sup>97</sup>
- Provided a stronger joint than would be provided with a plastic coupling because extruded pipe is stronger than injection-molded couplings.<sup>98</sup>
- Reduced the number of connections that might leak by 50%.<sup>99</sup>
- The alignment sleeve eased threading & helped prevent cross-threading.<sup>100</sup>
- The alignment sleeve relieved strain on threads caused by lateral forces.<sup>101</sup>

<sup>92</sup> Haney Affidavit (Exhibit B), at ¶¶ 7-11.

<sup>93</sup> Oct. 26, 2004, Deposition of Morris Haney (hereinafter "Haney Depo.") (Exhibit A-22), at 18:1-3; Oct. 25, 2004 Deposition of Roy Thein (hereinafter "Thein Depo.") (Exhibit A-23), at 31:2-20.

<sup>94</sup> Haney Depo., at 47:7-13.

<sup>95</sup> Haney Depo., at 18:21-25.

<sup>96</sup> Haney Depo., at 19:1-4.

<sup>97</sup> Thein Depo., at 28:11-19.

<sup>98</sup> Thein Depo., at 121:8-20.

<sup>99</sup> Haney Depo., at 18:3-5; Thein Depo., at 31:2-20.

<sup>100</sup> Haney Depo., at 18:5-8, 41:5-9.

In these ways, the invention satisfied the long felt needs, not adequately met by other attempted alternatives, of the art.

CertainTeed recognized these long felt needs when it commented in its internal memorandum that "manufacturers have been producing small diameter ... drop pipe ... with male threads on both ends for *quite some time*," that "Modern Products recently introduced a product line ... that does not require any couplings," and that "[t]his product assembles more quickly and saves the contractor money."<sup>102</sup> Also, the evidence in CertainTeed's November and December 2001 e-mails<sup>103</sup> demonstrating the extraordinary interest distributors had in #86 Modern Products' new product, in just weeks after its introduction, underscores the intensity of this long-felt need.

**E. Evidence of secondary considerations is often the most probative and cogent evidence in the record on the question of obviousness.**

As noted previously, the Supreme Court held in *Graham v. John Deere*<sup>104</sup> that evidence of "commercial success, long felt but unsolved needs, failure of others, etc." are relevant "indicia of obviousness or nonobviousness." The Federal Circuit has noted that "[i]n the intervening years since *Graham* a great deal of attention has been paid to the importance of secondary considerations."<sup>105</sup> In *Stratoflex, Inc. v. Aeroquip Corp.*<sup>106</sup> and many other cases,<sup>107</sup> the Federal Circuit has stressed that "*evidence of secondary considerations may often be the most probative and cogent evidence in the record.*"<sup>108</sup> Also, the Federal Circuit has repeatedly held that "secondary considerations, when present, *must be considered* in determining obviousness."<sup>109</sup>

CertainTeed's internal e-mails provide clear evidence of the long-felt need for Modern Product's product and of Modern Product's commercial success. In *Merck &*

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<sup>101</sup> Haney Depo., at 18:8-11.

<sup>102</sup> See Exhibit A-9 (emphasis added).

<sup>103</sup> See Exhibits A-6 & A-7.

<sup>104</sup> 383 U.S. 1, 17-18 (1966).

<sup>105</sup> *Ecolocchem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361, 1376 (Fed. Cir. 2000).

<sup>106</sup> 713 F.2d 1530 (Fed. Cir. 1983).

<sup>107</sup> *Vulcan Engineering Co., Inc. v. Fata Aluminium, Inc.*, 278 F.3d 1366, 1373 (Fed. Cir. 2002); *Custom Accessories, Inc. v. Jeffrey-Allan Industries, Inc.*, 807 F.2d 955, 960 (Fed. Cir. 1986) ("It can be the most probative evidence of nonobviousness in the record, and enables the district court to avert the trap of hindsight.").

<sup>108</sup> *Stratoflex*, 713 F.2d at 1538 (emphasis added).

<sup>109</sup> *Ruiz v. A.B. Chance Co.*, 234 F.3d 654, 667 (Fed. Cir. 2000) (emphasis added) (citing *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 873 (Fed. Cir. 1985); *Simmons Fastener Corp. v. Ill. Tool Works, Inc.*, 739 F.2d 1573, 1575 (Fed. Cir. 1984); and *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 306 (Fed. Cir. 1985)).

*Co., Inc. v. Teva Pharmaceuticals USA, Inc.*,<sup>110</sup> the Federal Circuit explained that “[c]ommercial success is relevant because the law presumes an idea would successfully have been brought to market sooner, in response to market forces, had the idea been obvious to persons skilled in the art.”

CertainTeed’s internal e-mails also provide clear evidence of CertainTeed’s efforts to copy the Shur-Align product. In numerous cases, the Federal Circuit has held that evidence of copying is strong evidence of non-obviousness.<sup>111</sup> In *Arkie Lures, Inc. v. Gene Lawre Tackle, Inc.*,<sup>112</sup> the Federal Circuit held that evidence of commercial success and copying are especially important in showing the patentability of a product in “a field already well explored”:

Commercial success and copying are tributes to ingenuity.... This rule is no less worthy when the new product narrowly fits into a field already well explored--like the fishing lure art--than when a transcendent scientific breakthrough is launched. The patent law is designed to serve the small inventor as well as the giant research organization.<sup>113</sup>

Here, the field of PVC well water pipe is also an old-line art, “already well explored,” and one that rarely witnesses new and exciting innovations. Modern Products’ commercial success in this market, and CertainTeed’s and other companies’ efforts to copy it, testify to the ingenuity of the invention claimed in the ‘480 patent.

The case of *Akamai Technologies, Inc. v. Cable & Wireless Internet Services, Inc.*,<sup>114</sup> is especially analogous to this one. In that case, the Federal Circuit found that the internal e-mails of the patentee’s competitor, which revealed the competitor’s “significant” efforts to copy the invention, were probative of non-obviousness. The Federal Circuit held that “the record shows that C & W expended significant effort to determine how Akamai’s products worked. Once it was determined that Akamai placed the server selection software at the DNS servers, C & W redesigned its Footprint product” to incorporate the patented features. The Federal Circuit found the defendant’s internal e-mails to be especially persuasive evidence of non-obviousness:

<sup>110</sup> 395 F.3d 1364, 1376 (Fed. Cir. 2005).

<sup>111</sup> See *Electro Scientific Industries, Inc. v. General Scanning Inc.*, 247 F.3d 1341, 1351 (Fed. Cir. 2001); *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1285 (Fed. Cir. 2000); *Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc.*, 75 F.3d 1568, 1574 (Fed. Cir. 1996); *Avia Group Intern., Inc. v. L.A. Gear California, Inc.*, 853 F.2d 1557, 1564 (Fed. Cir. 1988); *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 679 (Fed. Cir. 1988); *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 991 (Fed. Cir. 1988); *Hartness Intern. Inc. v. Simplimatic Engineering Co.*, 819 F.2d 1100, 1108 (Fed. Cir. 1987); *Hughes Tool Co. v. Dresser Industries, Inc.*, 816 F.2d 1549, 1556 (Fed. Cir. 1987); *Vandenberg v. Dairy Equip. Co.*, 740 F.2d 1560, 1567 (Fed. Cir. 1984).

<sup>112</sup> 119 F.3d 953, 957 (Fed. Cir. 1997).

<sup>113</sup> *Id.* at 957.

<sup>114</sup> 344 F.3d 1186, 1196 (Fed. Cir. 2003).

C & W's redesign process was documented in the record in internal emails from C & W engineers discussing Akamai's approach, identifying weaknesses in C & W's approach, and ultimately deciding to switch to the Akamai system.<sup>115</sup>

Likewise, in this case, CertainTeed's internal e-mails and memoranda show that when faced with the immediate commercial success of the Shur-Align product, CertainTeed made significant efforts to copy it.


All of the aforementioned evidence "gives rise to an inference that there is a nexus between the patented feature and the commercial success"<sup>116</sup> that both Modern Products, as patentee, and CertainTeed, as infringer, have enjoyed.

### Conclusion

Applicants respectfully submit that no *prima facie* case of obviousness exists. But even if it did, the overwhelming evidence of commercial success and copying by others outweighs that evidence. Applicants ask that the Examiner consider all of the evidence – both against a *prima facie* case for obviousness, and establishing a strong *rebuttal case* of non-obviousness – together. After all, the MPEP counsels that "[a]ll of the competent rebuttal evidence taken as a whole should be weighed against the evidence supporting the *prima facie* case."<sup>117</sup>

In view of the foregoing arguments and evidence, Applicants respectfully ask that the rejections be withdrawn. Believing that all matters raised in the Examiner's June 1, 2005, Office Action have been addressed, the undersigned respectfully requests that the application be allowed and passed to issue.

Respectfully submitted,



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<sup>115</sup> *Id.* at 1196-97.

<sup>116</sup> *Hughes Tool Co. v. Dresser Industries, Inc.*, 816 F.2d 1549, 1556 (Fed. Cir. 1987).

<sup>117</sup> MPEP § 716.01(d) (citing *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984)).

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